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ABSTRACT

This report outlines the requirements for a comprehensive, objective, and integrated guide to design of library physical facilities. It then presents a research plan directed at development of three products: (1) an authoritative catalog of the present knowledge of library functions, elements, and techniques of design as they relate to library physical facilities, (2) a manual for evaluating the performance of components of library facilities and for generating specifications of requirements, and (3) a "guide inquiry" system for developing library building design programs. The report then presents details of the tasks required to produce these results, of specific studies to be included in the work, of the time schedule and representative budget required. (Author)

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METHODS OF LIBRARY BUILDING DESIGN

-- A RESEARCH PLAN

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ABSTRACT

This report outlines the requirements for a comprehensive, objective, and integrated guide to design of library physical facilities. It then presents a research plan directed at development of three products: (1) an authoritative catalog of the present knowledge of library functions, elements, and techniques of design as they relate to library physical facilities, (2) a manual for evaluating the performance of components of library facilities and for generating specifications of requirements, and (3) a "guided inquiry" system for developing library building design programs. The report then presents details of the tasks required to produce these results, of specific studies to be included in the work, of the time schedule and representative budget required.

1. INTRODUCTION

BACKGROUND

Library physical facilities should be designed to satisfy clearly defined requirements within the constraints of budgets and needs for library service in specific situations. The prevailing method for doing so has been to design libraries through the joint efforts of a team of people--a librarian, an architect, and perhaps a librarian-building consultant. Unfortunately, few librarians have the breadth of professional expertise in architecture or the depth of experience in design of libraries to establish their requirements, and few architects have the understanding of the functions and purposes of the library as an operational institution. With the exception of the consultant, there is seldom any experience in planning and designing libraries, and even he was probably involved in the total construction program of only one library building. The result is that these individuals will determine the principal characteristics of the library based primarily on their own interests and experience, at best supplemented by a series of checklists. There is a high probability that the design program will have significant gaps, be subject to the fashions of the moment, and be dependent upon the idiosyncracies of the individuals involved.

Existing published materials do not provide an adequate answer to this problem. First, they are in such fragmented form, without any systematic approach, that they fail to direct the efforts of the user. Second, they are inconsistent in the emphasis given various aspects of library design and frequently represent mere "shopping lists" of equipment, furnishings, and architectural features. Third, they provide little, if any, basis for evaluating or assessing the actual performance of library physical facilities.

There is, therefore, a clear need to develop a comprehensive, objective, and integrated guide to the design of library physical facilities--a guide which relates the total library environment to the physical setting for library activities; a guide which includes all aspects of the design process; a guide which leads the user through the work he must do.

SUMMARY

The research plan presented in this report is directed at developing such a guide and, in fact, a guided inquiry system for library design. This guided inquiry system should be capable of leading those charged with developing a library building program through an orderly sequence of steps by which they can determine the requirements for the library facilities as well as the kinds and combinations of library elements and equipment that would best respond to these requirements. It would include supplementary materials to assist the design team in translating requirements into specifications for library facilities. It should be able to function on several

levels of sophistication, ranging from a handbook with associated indexes and descriptive materials to a highly computerized interactive simulation with displays and on-line information storage. The purpose of the research plan is to determine the exact nature of this guided inquiry system, to determine the areas of library design it should cover, and to develop the supporting material.

The research plan would require an estimated three years, divided into two phases. Phase I would result in an authoritative catalog of the present knowledge of library functions, elements, and techniques of design as they relate to library physical facilities. It would also provide specifications for the specific scope of the guided inquiry system and details of the work required to produce it. Phase II would result in the guided inquiry system itself together with the supplementary material required to demonstrate its operation. It would also result in a number of specific products and publications, including a manual for evaluating the performance of components of library facilities and for generating specifications of requirements.

Estimated budgets are: Phase I: $83,000; Phase II: $225,000.

2. RESEARCH PLAN

STRUCTURE OF THE PLAN

The research is organized into three areas of work: (1) Requirements Analysis, (2) Component Analysis, (3) Synthesis.

The purpose of "Requirements Analysis" is to provide an organization of the various answers to the question, "What is a Library?" The results will be a catalog of the functions of libraries, as they affect or relate to their physical facilities, including not only the information processing and storage functions, but also the psychological, situational, and aesthetic functions.

The purpose of "Component Analysis" is to identify the physical components and features from which alternative library designs can be developed. The results will be a set of criteria and a methodology for the orderly assessment of their effectiveness, which would be applicable to the evaluation of component parts of existing library physical facilities as well as improving the process of generating requirements for new ones.

The purpose of "Synthesis" is to develop the guided inquiry system as a means of determining what library facilities, combining various components and features together in an integrated design, would best satisfy the requirements of a specific library situation, both present and contemplated.

The work will begin simultaneously on all three of these areas, but the emphasis will gradually shift from "Requirements Analysis" in the first year to "Components Analysis" in the second to "Synthesis" in the third. Figure 1 illustrates the structure of this research design and serves as an index to specific tasks discussed in detail later. As it shows, some of the tasks, such as "Literature Search" which is the starting point in all three areas, cut across two or three of them.

FIGURE 1

RESEARCH AREAS

REQUIREMENTS	COMPONENTS	SYNTHESIS
"What is a Library?"	"From what can a Library be built?"	"How should the Library be built?"
Catalogue and taxonomically relate library functions and elements.	Devise library demand criteria in quantitative terms where possible.	Explore methodologies in state of art as basis for guided-inquiry system.
Task 1 Search Literature	Task 1 Search Literature	Task 1 Search Literature
Task 2 Survey Specialists	Task 2 Survey Specialists	Task 2 Survey Specialists
Task 3 Survey Facilities	Task 5 Develop Approaches to Library Evaluation Criteria	Task 6 Develop Approaches Systematic Facilities Design (Guided Inquiry System)
Task 4 Define types of Library Services and Functions		
Task 7 Prepare Authoritative Catalog and Guide to Present Practice		
Investigate new areas of technology with implications for library design. Task 13	Produce technique for selecting functions and designing appropriate facilities elements. Task 8 Task 9 Task 10 Task 11 Task 12 Task 15	Develop prototype systems for guided inquiry--for three levels: manual, aided, automated. Task 14
Develop techniques for incorporating new technological developments and results of users studies. Task 20	Develop evaluation method to rate library facilities both existing and planned. Task 21 Task 22	Produce guided inquiry systems for library design with all necessary materials. Task 16 Task 17 Task 18 Task 19

RESULTS OF RESEARCH WORK

Three specific products are expected to be produced by this work:

(1) An authoritative catalog and guide to present practice with respect to library functions, elements of physical facilities, and techniques and standards of design.

(2) A manual for evaluating the performance of various library physical facilities, equipment and furniture, and for generating specifications of requirements.

(3) A guided inquiry system for developing library building design programs.

In addition to these primary publications, quarterly progress reports and a final report will be prepared during each phase to describe the actual research undertaken and to convey results obtained that are not incorporated in the primary products.

The research work will also result in the collection of data and documents relating to the current state of the art of library planning and design and the problems attendant to equipping and furnishing the physical plant in such a manner so as to create the best possible total library environment.

MONITORING OF THE RESEARCH

To assume adequate quality control, the research design includes provision for an advisory panel to review the direction of the study, to suggest areas for fruitful inquiry, and to insure the quality and usefulness of the documentation produced. The panelists would be divided among librarian-building consultants, architects with library building experience, and representatives of the Federal Library community.

This management program, in addition to providing quality control, will also help to pace the contribution of the various specialists working on the research project to clarify issues, and to facilitate communication among the different disciplines involved in the study.

3. SPECIFIC TASKS

As shown in Figure 1, a number of specific tasks are called out as part of the research plan.

TASK 1 Inventory of Present Design Standards

The following tentative taxonomy will be used to organize the information:

LIBRARY PLANNING

Using a Building Consultant
Choosing an Architect
Formulating a Building Program
Remodeling and Renovation
Current Architectural Styles in Library Buildings
Site Location Considerations
Moving the Collection

DESIGN CHARACTERISTICS BY TYPES OF LIBRARIES

Recreational Libraries
School Libraries (elementary and high school) (perhaps)
Technical School Libraries
Academic Library Facilities
Research and Special Libraries
National or Regional Service Libraries (perhaps)

LAYOUT OF LIBRARY UNITS

Administrative Unit
Technical Services Unit
Circulation Services Unit
Reference Services Unit
Reader Stations Unit
Materials Storage Unit

SPECIFICATIONS FOR SPECIAL FACILITIES OF LIBRARIES

Audio-Visual Unit
Microforms Unit
Photoduplication Unit
Automation Unit

EQUIPMENT AND OTHER CONSIDERATIONS

Furniture (all types)
Lighting
Mechanical Systems
Seating
Shelving
Catalogue of Available Materials
Floor Coverings
Protecting the Library's Contents (theft and fire protection, insect control) atmospheric deterioration.

As a result of the investigations undertaken during the study, there will be a need to revise this taxonomy by combining classifications or introducing new ones, with the advice and approval of the advisory panel.

The following are some of the major sources that will be consulted during the review phase of the operation: Applied Science and Technology Index, Architectural Index, Art Index, Bibliographic der Fremdsprachigen Zeitschriftenliteratur, British Humanities Index, Building Science Abstracts, Education Index, Engineering Index, Housing and Planning References, Internationale Bibliographic der Zeitschriftenliteratur, Library Abstracts, Library Literature, P.A.I.S., and Social Science and Humanities Index. In addition, the resources of the Clearinghouse for Federal Scientific and Technical Information, the Scientific Information Exchange of the Smithsonian Institution, and other specific sources will be explored.

The reviewers searching the literature selected from the sources indicated above will prepare cards describing the design standards discussed or implied by the resource literature. At the half-way point in the literature search, a review will be made of the literature search for areas missed or requiring further attention and the implication of the literature for restructuring the taxonomy. The second half of the literature search will concentrate on filling the gaps in the information, and completing any new areas suggested by review process.

TASK 2 Survey of Selected Library Specialists

Selected individuals from the following categories of library related specialties will be questioned:

Library Equipment Manufacturers and Representatives
Equipment Designers
Library Architects
Army Librarians
Other Federal Librarians
Academic Librarians
Bibliographic Specialists
Public Library Librarians
Retrieval Systems Specialists
Library Building Consultants
Investigators of Inquiry and Library Behavior

A telephone survey of people in the specialties indicated would then lead to interviews in-depth with selected individuals. These interviews will be directed toward defining the leading edge of the state-of-the-art, and eliciting areas where breakthroughs are expected or a need for improvement exists.

A second-round questionnaire will be sent to the selected specialists at the same time that the literature search reaches the half-way point. Using the results as a guide, the questionnaire will ask the practitioners about design standards in the specific areas that seem to have been omitted in the literature.

A third-round questionnaire will be sent out at the completion of the literature search and will ask the leading practitioners a series of highly speculative questions about the future of libraries and new approaches to library design developed by the principle investigators, drawn from their backgrounds, and analysis of the literature.

TASK 3 Survey of Existing Library Facilities

Libraries will be visited, selected on the basis of their innovative programs, their integration with other services in the community, the uniqueness of their architectural style, their use of equipment.

From the survey of the literature and other examples known to the project staff, a list will be produced for ranking by the management panel. Library projects that are "in progress," but, well enough defined to be useful and sufficiently fixed to permit reliable comment, will also be suggested for visits. The management panel will also be asked to add to the list examples of facilities that supplement ones on the list in terms of the criteria.

TASK 4 Define Types of Library Services and Functions

A comprehensive taxonomical system will be structured to describe the many ways of organizing library services and functions. In this way, the taxonomical system can recognize that the degree of specialization of library services and functions varies greatly with the size of the library, and that there are many different ways of combining activities from libraries that consist of a single room for a specialized clientele to very large multi-purpose libraries where almost every activity has a separate physical identity.

TASK 5 Approaches to Library Demand and Requirements Criteria

The researchers will explore the presently devised quantitative methods for planning, such as the application of operation research and statistical analysis.

TASK 6 Exploration of Approaches to Systematized Facilities Design

On the basis of the surveys discussed above, a list of existing procedures and methods of evaluation of library design and performance will be developed. This list will serve as the foundation for exploring new approaches to the design problem. Also the current technology being developed for systematic design of facilities in other areas, particularly in computer graphics as aids to design will also be investigated for possible approaches. The use of operations research in facility allocation and in the evaluation of the adequacy of existing facilities will also be reviewed. Techniques with possible relevance to the problems of planning and design of library facilities will be identified for additional research necessary to refine the techniques.

TASK 7 Preparation of Phase 1 product tentatively titled A Guide to and Evaluation of Existing Practices Concerning Libraries as Physical Facilities with Recommendations for Methods of Improving these Practices.

The primary result of Phase 1 will be a comprehensive report of the activities and results of the work carried out.

PHASE II

Phase II will encompass the research described below as refined by the insights gained during Phase I, including complete documentation of the present criteria and specifications.

The Phase II research effort will first undertake tasks to develop the individual techniques and routines that were required by the definition of the explicit planning and design methodology produced in Phase I. Where problems are encountered and the expected technique cannot be developed alternatives will be explored or adjustments in the whole methodology will be made to circumvent the problems. The project manager will be responsible for maintaining, on a current basis, the state of the art facilities programming methology as it evolves. On this basis he will select the types of expertise and direct the level of effort on the various elements under development to assure balanced progress on the whole methology. Use of the management panel will be continued during this phase of the study as their advice and evaluations are essential to the development of a sound system of inquiry. The following tasks will be carried out during Phase II.

TASK 8

Using the system developed in Phase I, the research team will attempt to relate each element in the taxonomy quantitatively to a characteristic of the users of the library. This research will try to substantiate existing factors used to justify facilities and to establish new factors where none exist or a poor selection has been previously used.

TASK 9

Develop methods for selecting different configurations to meet stated requirements.

TASK 10

Prepare detailed standards for the set of library elements that were identified and described in Task 4.

TASK 11

Prepare detailed performance specifications for furniture and equipment. Include suggested new items where unfulfilled needs have been identified by the research.

TASK 12

Develop indicators of the relative importance of various library services and combine them into a method for establishing requirements for library facilities.

TASK 13

Identify and describe new developments in technology with important implications for libraries. During the course of the investigation the contractor will keep track of new developments in library building practices. The contractor will identify new developments in the surveys of facilities and selected specialists and in the literature search. The investigators will try to determine an estimated time for expected change to have effect, and, where possible, the chain of prior developments that would be requisite.

Emphasis will be placed on identifying developments that move toward a greater integration of library services with the principal activity they support. A draft of this catalogue will be sent to the management panel for them to review at approximately the eighth month of the study.

TASK 14

Develop prototype systems for improving library facilities planning and design and describe the use of methods in practice. At this time it seems probable that the improvements will be developed out of the analysis of the tasks listed above. In essence they will be a mixture of the ideal conceptualizations existing in the minds of all the parties engaged in the planning process and the realities of present practice.

To this end, the report from Phase II will also contain a discussion of

differences between expectations for facility designs and the realities of the finished physical plant and its environment. There will also be a discussion of the apparent implications of these differences and a series of hypotheses about the research areas that should be studied further.

TASK 15

The result of this analysis will be published as a manual for evaluating library performance and generating justified requirements for new facilities. This manual will incorporate the performance specifications and examples of library equipment and furnishings that were developed during this part of the research.

TASK 16

Experiment with computer graphics and other techniques for providing previews of the character and qualities of the contemplated library environment. Conduct some physical experiments with existing variations in library environments to develop a repertoire of predictive correlates between environment and behavior.

TASK 17

Prepare preliminary materials and conduct extensive simulations of process of designing library facilities, including a variety of exercises providing examples of modifications, addition, new separate facilities, new facilities as part of a complex, increase the fidelity of the simulations as time progresses.

TASK 18

Assemble the different techniques, routines, procedures, and supporting data into a guided inquiry system for programming library facilities.

TASK 19

Prepare materials necessary to demonstrate the system.

TASK 20

Define a mechanism for integrating new technological developments into the library planning and design processes on a continuing basis.

TASK 21

Formulate an evaluation technique that can be used to validate design assumptions and evaluate performance of new facilities.

TASK 22

Develop techniques for evaluating actual requirements for library facilities in comparison with the level of services provided by existing facilities.

4. SPECIFIC STUDIES

Many specific studies are required to carry out the tasks listed above. These will be identified and developed during the course of the work. We would expect that the results of studies with respect to library use and other studies of information technology can be incorporated into the guided inquiry system that will be developed by this project. As examples of how this can operate, the following studies appear to have high priority. Each of them has implications for one or more of the above tasks.

THE UTILITY OF OPEN STACKS

One study that presently appears to be necessary to improve our knowledge of the state of the art is an examination of the concept of open stacks. Since the mid 1920's a fundamental tenet of librarians has been that open access to materials is desirable because it will increase patron usage of the collection. This is supposed to occur because the patron will encounter additional titles on the same subject that he is not aware of as a result of going to the shelf. At first glance this appears to be a sound assumption. It may be sound. However, on the basis of a limited literature search, it appears to be only an assumption with no real evidence to give it credibility. There is even some evidence (1, 2) that can be interpreted as indicating browsing cannot be and is not effective. With the development and use of the module method of construction in libraries the concept of open access was pushed even further with the addition of numerous reader stations being located throughout the stacks and the use of free-standing stacks. In essence the stack area became the public service area. This approach to patron service is relatively expensive in terms of its much higher square footage allotment than for a closed stack-formal reading station approach. This of course assumes that the collection size and number of reader stations provided are the same. However, a careful trade-off analysis would have to balance this against the probably increased personnel costs. It would seem to be essential to examine this entire question in detail because it is the basis from which all library facility planning evolves and also revolves around.

In the time period allotted for Phase II, such a study seems feasible. The study would require the close cooperation of some of the participating

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[1] Fussler, Herman H. and Simon, Julian L. Patterns in the Use of Books in Large Research Libraries. Chicago, University of Chicago Library, 1961.

[2] Trueswell, Richard William. "Determining the Optimal Number of Volumes for a Library's Core Collection," Libri, 16 (no. 1, 1966), pp. 49-66.

libraries in a series of experiments, the exact nature of which would be worked out during Phase I. The exhaustive literature search might provide some material that will permit a reduction in the scope and duration of the experiments.

In general terms the study will be concerned with the question of whether there is a difference in the amount and intensity of use of the collection in open or closed stack situations. The problem of quality of service should also be considered, if at all possible. Three or more libraries would have to be involved in this study. Each library might be asked to use three or more methods of collection-reader station arrangements (open stacks with interspersed reader stations, open stacks, but no interspersed stations, closed stacks with a formal reader station arrangement, and closed stacks with an informal reader station arrangement). Random samples of users and the degree of use made of the collection under these varied conditions would provide the raw data on amount and intensity of use. The matter of quality might be handled by asking the users in the random samples what the purpose of their use was (possible categories: recreation-escape reading; recreation-general information; working use-job or course work related; working use-research related).

The findings of this study will be carefully analyzed; the management panel will be asked to review and suggest possible approaches to the problem. This will be necessary as the findings and their interpretations will be pivotal in directing the course of developing and the content of the guided inquiry system.

EFFECTIVENESS OF PRESENT DESIGN PRACTICE

Another study that might be undertaken would be a study of the degree and extent to which library building consultant's recommendations are accepted and carried through from suggestion to the finished library. Such a study would be helpful in terms of planning expectations and to some extent with developing evaluation and performance standards. Most building consultants keep a record of each building on which they serve as a consultant. This record will contain, in most cases, the recommendations made by the consultant. With their assistance it would be possible to compare the recommendations to the building program as finally formulated and with the final building. The consultants can be asked why and for what purpose (the expectations) the recommendations were made. By knowing what was expected, in the case of recommendations carried through to the final physical plant, one can check the actual performance and gain some knowledge as to the success or failure of the recommendation and its underlying concept.

PERFORMANCE STANDARDS

Another area of concentration will be that of developing performance standards and the means of evaluating the performance. The focus of this aspect of the study will be the total physical environment of libraries. The product of this work will be:

(1) performance specifications concerning the total environment

(2) devices to permit testing and evaluation of

(a) plans submitted for evaluation

(b) actual physical structures after completion

In the past, building programs have primarily concentrated on the types and size of facilities required. They have rarely indicated what was expected in the way of performance and therefore there has been no way to evaluate how well the building measured up to expectations. Functional relationships are discussed only in terms of departments or units within the library. There has been little or no discussion of the relationship of various classes of users tc the physical plant (patrons, staff members, maintenance personnel or visitors for example). Furthermore they do not include qualitative statements, including the feeling to be conveyed (psychological impact) in various sections of the library. For example: sense of concentration, sense of other people at work as an incentive for study, invitation to browsing in various strategic locations, degree of formality or informality desired, avoidance of bureaucratic or institutional feeling, atmosphere as affected by lighting (natural and artificial), color, form, texture, in-door to out-door relationships and its desired strategic locations, need for variety and choice versus uniformity, etc. These are some of the factors that would be considered in developing the performance specifications.

Regarding the performance specifications, obviously a systems approach, broken down into sub-systems, will be the overall framework. The danger of being overly "systematic" with certain activities or conditions overlooked because they do not fit neatly into pre-packaged slots has to be faced.

The following rough outline of the evaluation system that might be developed is based on existing work in the field of plan evaluation. The procedure would be:

(a) The measurement of one "element of value" at a time when comparing or evaluating alternative proposals.

(b) A graphic means of representing the functional aspects of the plan whenever possible.

(c) A statement of objective facts.

(d) The establishment of standards.

(e) A rating scale, zero to nine for recording the response to the standards.

(f) A bar graph presentation of the ratings of the individual elements.

(g) A weighting system for the value of each factor, <u>if</u> the total evaluation shall be expressed in quantifiable terms.

It is suggested that two distinct categories be included in the process of rating the standards.

(a) Subjective ratings in those areas where quantification is not, or not yet, possible.

(b) A catch-all category for idiosyncratic likes or dislikes.

It is, however, important to make explicit what these two categories consist of. What value was to be given to the category in the total rating would be important as these would be subjective judgments that would vary from individual to individual and therefore need to be clearly defined.

Another method may also prove useful in working on the problem of evaluation of plans. Existing computer programs may provide a way of introducing computer-graphic techniques into the problem of evaluation. It is expected that in a few years it will be possible to adapt them to receive plans and sections of buildings and to provide a bar graph evaluation of the quantifiable aspects of the building in response to mathematical models stored in the computer. This system offers another capability, that is man-machine interaction during the design process. While the present requirements are predominantly in terms of post facto evaluation of proposed plans, it would be most desirable to offer the designers a tool which would permit improvement of the proposed plan during the design stage in an iterative process.

It is anticipated that some of the work required to accomplish the Task 13 will best be handled by ad hoc arrangement with the LTP and engineering organizations. The type of testing that will be carried out in this manner will be the technical testing and formulation of specifications. The matter of performance standards would be a joint project involving architects, librarians, engineers, and users.

The final report, which would include the guided inquiry system, would also provide the means for demonstration of several levels of sophistication of use. The system would be designed so that it may be used in a purely manual version or in a computerized system. The programmed system of inquiry would lead the building program planners and designers through a series of steps that would (1) firmly justify the construction request on the basis of explicit evaluations of the service requirements, (2) suggest ways to explore the use of facilities presently available, (3) make it possible to examine in a systematic manner alternative methods for developing the facilities, (4) aid in communicating the service requirements to architects and engineers because it was developed by a team representing all aspects of the planning and designing situation, (5) provide a basis of specifying the essential features and equipment so that when construction and equipment funds are limited the priorities are more likely to be properly placed, and (6) establish some criteria for the consistent and objective evolution of the performance of the completed library and also for estimating performance from plans.

5. TIME SCHEDULE

PHASE I

Work on Phase I would require one year. Reports on the progress of the study would be made: (a) a preliminary report one month after the project began, (b) quarterly report at the end of the third, sixth, and ninth months, (c) a final draft of the Phase I report at the end of the tenth month and (d) the final report at the end of the twelfth month. Other reports would be submitted as the need arose.

PHASE II

Work on Phase II would require three years. The same report pattern would be employed except as noted above with reference to the preparation of the final report.

6. BUDGET

	PHASE I	PHASE II
Professional Staff 4 (at average of 25% each) 6 (in Phase II)	15,000	45,000
Clerical Staff	6,000	15,000
Support Staff	10,000	30,000
Total Salaries	31,000	90,000
Overhead (including benefits)	19,000	54,000
Consultants and Management Panel	20,000	50,000
Travel	9,000	18,000
Supplies, expenses, communication	2,500	9,000
Publication	1,500	4,000
Total	83,000	225,000

AN ADDENDUM TO
METHODS OF LIBRARY BUILDING DESIGN
-- A RESEARCH PLAN

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October 22, 1969

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AN ADDENDUM TO
METHODS OF LIBRARY BUILDING DESIGN--A RESEARCH PLAN

Introduction

This addendum has three purposes, (1) to provide supplementary information relating to all of the tasks to be carried out during Phase I (Task 1 to 7), (2) to provide details of the contemplated product of Phase I (Task 7 - the Guide and Handbook), and (3) to provide more description of the furniture and equipment testing work (Task 11) contemplated during Phase II.

All of the tasks designated as being performed during Phase I are designed to serve several immediate purposes: (1) to identify existing practice in the planning and construction of Army libraries; (2) to identify existing practices in planning and constructing civilian libraries of similar types; (3) to draw from current practice and theory, in both the Army and civilian fields, the body of basic principles that ought to govern any library building program; (4) to identify the basic requirements, according to our present level of knowledge, for each type of Army library. These results of Phase I are to be embodied in a Handbook-Guide to Current Recommended Practices in Planning and Constructing Army Library Facilities. Finally, another, longer range purpose is to identify areas of further research where existing practice operates on few if any proven principles.

It should be noted that this work is to be specifically directed toward Army library building problems. However, it is anticipated there will be an extremely high degree of carryover to other types of libraries, and therefore it is expected that most of the findings would be applicable to other libraries built and used by the federal government as well as civilian libraries with functions similar to those of Army libraries.

Details on Tasks

Task 1. The taxonomy suggested in Task 1 is to be used in organizing the literature search. It will also be used as the initial organization to be used in the preparation of the Handbook-Guide. While the literature search will primarily focus its attention on the Army library situation, it will also take note of relevant or apparently relevant material from other areas of library work. This work will begin immediately after the authorization to begin has been received. It will be carried on at a highly intensive level during the first three months of Phase I.

Task 2. On the basis of the literature review and after consultation with the management panel, which will have at least two representatives of the Army library system, Task 2 may be reduced in scope. It may be possible to omit the telephone survey and proceed with in-depth interviews on the basis of individuals who are most active in the specialities outlined in Task 2, including persons who have published articles on the problems under investigation and who are known to highly regarded by numbers of the management panel. The "third-round" questionnaire of Task 2 could be delayed until Phase II or incorporated into the in-depth interview.

Task 3. Task 3 involves site visits, made to all types of Army libraries as well as civilian libraries. Installations to be visited will be selected to insure that all examples of base, technical, and research libraries are covered, including those that provide services to both large and small populations, those that provide only the usual services in the usual manner, and those that have innovative programs.

Tasks 4, 5, and 6. Tasks 4, 5, and 6 will bring together the results found in the literature, from specialists, and from site surveys for the purpose of developing basic principles to serve as guides for the construction and evaluation of Army libraries and to identify areas that require further research. Task 4 and 5 are designed to formalize and systematize the task of analysis of requirements to the end of accurately determining the amount and kind of facilities required to carry out specified functions effectively. Task 6 is designed to aid in the identification of problem areas that will need to be explored further in Phase II in contrast to those areas in which solid principles now exist that may be used with some degree of confidence.

Task 7. The primary product of Phase I is to be the Handbook-Guide. Task 7 will summarize most of the results of Phase I activities and result in the final report, covering Phase I activities and containing the Handbook-Guide. However, it should be emphasized that the Handbook-Guide will only be able to summarize existing knowledge about good practice. Although areas lacking sound principles will be noted in the manual, it can not provide the result of subsequent research necessary to develop those principles. Therefore the research team considers this to be an interim Guide that should be used on library construction projects, especially for planning changes in existing units, only until Phase II research is completed and a total body of principles may be established.

The ultimate product of the four or five year study would be a manual that will, on the basis of researched principles, provide Army librarians with the means: (1) to firmly justify a request for construction to the base commander and other administrators, based upon an explicit evaluation of the requirements for service, (2) to creatively explore usages of existing physical facility resources, (3) to make possible a systematic exploration of a variety of possible combinations to secure the required space, (4) to make possible a more effective means of communicating the requirements to architects and engineers, (5) to provide an authoritative base for specifying a number of performance characteristics in furniture and equipment; and (6) to provide convincing criteria for the evaluation of the performance of the library as a complete physical entity. The interim Phase I manual can not be expected to be as comprehensive nor as authoritative due to time and budget limitations.

Detailed Outline of Handbook-Guide

As a matter of interest the following is a tentative outline of what the research team sees as being covered in the interim manual, realizing of course, that as a result of the thorough literature search in Task 1 as well as other tasks outlined it is subject to change.

I. Preplanning Activities

A. Analysis of existing situation

1. Existing standards as specified in Army regulations
2. Comparison of existing standards for civilian and federal libraries of types similar to Army libraries
3. Suggestions for changes in practices

B. Selecting a library building consultant

1. Why have a consultant?
2. How does one choose a consultant?

B. Selecting a library building consultant (continued)

3. When should the consultant be chosen?
4. What does a consultant do?
5. How much do consultant's services cost?
6. Trends in library building consultation

C. Selection an architect

1. When should one select the architect?
2. Where does one find the names of potential library architects?
3. How does one select the architect?
4. What are the various functions of the architect and will the same person be responsible for all phases of the work?
5. How much will it cost to have a civilian architect involved in the planning?

D. Pro's and Con's of remodeling and renovation

1. First steps
   a. Conduct a community survey
   b. Review of library objectives
   c. Draft a projection of future growth and needs
2. Renovation or new construction
   a. Evaluation of situation by librarian, building consultant, architect and installation administrator
   b. Site location considerations
   c. Consideration of structural capabilities of existing facilities
   d. Estimation of costs
3. If renovation is most expediant--what are the options?
   a. Seek simplest solutions
   b. Strive for minimum structural change
   c. Consider use of mezzanines
   d. Consider converting unused basement facilities for public service areas, staff rooms, etc.
   e. Consider additions to existing unit
   f. Consider using an interior design person to achieve maximum effect (total environment must be considered)
4. Leasing as alternative

II. Planning Activities

A. Preparation of building program

1. How is it prepared?
2. Who prepares program?
3. What does it contain?
4. How is it used?

B. Schematic phase

1. More precise cost figures
2. Site visits
3. Examination of codes, regulation, policies, etc.
4. Recommendations regarding methods of operating the project
5. Communications--inter and extra-agency

C. Site selection

1. Overall installation plans and projected future growth
2. Site considerations
   a. Size of lot
   b. Location--access
   c. Orientation
      (1) Shape of lot and type of building
      (2) Need for light penetration drawings
   d. Slope of land
   e. Ground conditions

D. Design Development

1. Specific design selected and examined in detail
2. Preparation of specifications
3. Review of estimate cost
4. Securing bids
5. Role of agency procurement officials

III. Design Characteristics of Types of Army Libraries

A. General characteristics--desirability of modular construction

1. Fix function design vs. modular design
2. Characteristics of modular construction
3. Physical requirements (general) of modular library buildings
4. Advantages and disadvantages

B. Base libraries serving recreation and educational needs

1. General trends in civilian and perhaps Army recreational libraries
   a. Site development
      (1) Accessibility
      (2) Parking Facilities
      (3) Landscaping
      (4) Library entrance and facade design
   b. Building provisions
      (1) One-floor plan
      (2) Use of look in windows and doors
      (3) Exhibit space
      (4) Minimum use of fixed partitions and installations
      (5) Concern for total environment

2. Specific trends in civilian and perhaps Army recreational libraries
    a. Furniture--varied in size, shape, color, and arrangement
    b. Special provision for children's needs
    c. Special periodical display units
    d. Control desk--central location but not dominating
    e. Use of outdoor reading areas
    f. Special consideration given to providing adequate and well planned staff working areas
3. Specific trends in civilian school libraries
    a. Continued use of standard printed materials
    b. Increasing emphasis on special audio materials for use in the library and home
    c. Increasing emphasis on special visual materials for use in the library and home
    d. Increasing emphasis on special nonbook materials for use in the library and home
    e. Implications of changing collection

C. Technical libraries

1. General trends as in base library section
2. Specific trends--as in base library section
3. Implications of the special information transfer function of this type of library in terms of physical space requirements

D. Academic--research libraries

1. General trends
2. Specific trends
3. Implications increasing use of nonbook materials

IV. Layout and Design of Standard Library Units

A. General Considerations

1. Analysis of work and patron traffic patterns
2. Formulation of space requirements for various activities
3. Allocation of space in terms of traffic patterns and efficient work procedures

B. Technical services areas (full example)

1. General considerations
    a. Adequate accommodations are essential for effective service
    b. One of the most difficult areas to expand and maintain effective service
    c. Should be planned for peak use in 20 years
    d. Leave as much flexibility in area as possible

2. General location in relation remainder of library
   a. Separate room--thoroughly sound proofed
   b. All t.s. units should be placed as a group
   c. Should be placed so as to receive natural lighting
   d. Should be placed so as to have reasonable access to public service desk
   e. Should be placed so as to have direct access to public catalog and collection
   f. Should be placed on the ground level floor
3. Relationship between several departments
   a. Shipping and receiving should be near acquisitions and service elevator
   b. Acquisitions should be near receiving and cataloging
   c. Cataloging should be near acquisitions and the public catalog and other bibliographic aids
   d. Book preparation should be near cataloging and service elevator
   e. Binding and mending should be near shipping and service elevator
4. Arrangement within specific departments
   a. Shipping and receiving--separate room
      (1) Covered loading dock
      (2) Service elevator, easily accessible
   b. Acquisitions
      (1) Designed so work need flow in only one direction
      (2) Sound proof area for typing and bookkeeping machine operation
      (3) Shelving to accommodate current shipments, gifts, etc.
   c. Cataloging (same as acquisitions)
   d. Book preparation
      (1) Work stations
      (2) Shelving
   e. Binding and mending (same as book preparation)

C. Circulation services (similar arrangement as t.s. section)

D. Reference services (similar arrangement as t.s. section)

E. Reader stations (similar arrangement as t.s. section)

F. Collection storage (similar arrangement as t.s. section)

G. Administrative offices (similar arrangement as t.s. section)

V. Layout and Design of Special Library Units

A. Audio-visual unit--special considerations
   1. Screening and listening facilities for users
   2. Storage of materials
   3. Processing, inspection, and repair
   4. Control (circulation) and assistance to users in the library

A. Audio-visual unit--special considerations

5. Light control
6. Power requirements (anticipated demand for services)
7. Environmental control to insure maximum life space of medium

B. Microforms unit (similar to A.-V. unit)

C. Rare books and special collections unit (similar to A.-V. unit)

D. Automation unit (similar to A.-V. unit)

E. Photo duplication unit (similar to A.-V. unit)

VI. Furniture and Equipment

A. Seating and furniture

1. Seating
   a. Estimation of needs
      (1) Standards
      (2) Knowledge of library's patron's habits and materials used
   b. Space required to meet needs
2. Furniture
   a. General considerations
      (1) Cost
      (2) Appearance
      (3) Durability
      (4) Maintenance Cost
   b. How much should be allocated to equipment and furniture
   c. Trends in library furniture
      (1) Strong Scandinavian influence
      (2) Emphasis on color (warmer darker colors)
      (3) Less formal and institutional styles--less angular
      (4) Designed with comfort of user in mind
      (5) Use of many types and styles in same library

B. Floor coverings

1. Selection Considerations
   a. Design
   b. Durability
   c. Stain-resistance
   d. Acoustical properties
   e. Resilience
   f. Maintenance
   g. Cost
2. Common types
   a. Resilient flooring material
      (1) Cork
      (2) Rubber
      (3) Vinyl

a. Resilient flooring material (continued)
   (4) Linoleum
   (5) Asphalt
   (6) Seamless (example Torginol Duresque)
b. Hard flooring material
   (1) Terrazzo
   (2) Concrete
   (3) Ceramic Tile
   (4) Marble
   (5) Magnesite
c. Wood flooring
d. Carpets

C. Shelving

1. Estimation of requirements
2. Types of shelving
   a. Free standing
   b. Multitier (self supporting)
   c. Compact shelving
3. Open or closed stack considerations and implications for service and space requirements

D. Lighting

1. Estimation of requirements
2. Daylight
3. Artificial lighting
4. Should one use a special lighting consultant

E. Mechanical system

1. Heating
2. Cooling
3. Ventilating
4. Humidity control
5. Need to consider very carefully in all project but especially in remodeling or renovation--removal of wall or adding wall will change entire pattern

F. Other equipment

1. Card catalog
2. Book trucks
3. Patron operated duplication equipment
4. Microform readers
5. Tape decks and record players
6. Projection equipment
7. Mechanical circulation systems

VII. Other Considerations

A. Protection of library and contents

1. Acts of God
2. Preservation of materials (against elimate, insects, fungus, molds)
3. Theft, vandelism, mutilation
4. Fire protection
5. Insurance

B. General esthetic factors

1. Total environment
2. Use of color
3. Use of texture
4. Use of lighting
5. Use of sound proofing
6. Use of natural vistas

C. Transferring the collection

1. Planning the move
2. Methods of moving

D. Evaluation and performance standards for completed library

VIII. Bibliography

IX. Appendices--Illustrative Material, Standards, Formulas, Space Requirements, Etc.

X. Index

Testing

In terms of Task 11 in Phase II the following points should be kept in mind. The research team would expect to make extensive use of existing furniture and equipment testing programs and work already completed. The project will of course attempt to develop a close working relationship with A.L.A.'s Library Technology Program. It is expected a major share of the testing program would be subcontracted to L.T.P. Some additional testing will be carried out, as necessary, in conjunction with the UCLA School of Engineering. It should be clearly understood that this study can not undertake an exhaustive original testing program for all library

furniture and equipment under the discussed fund commitments. The L.T.P. has estimated in order to test the 107 different types of metal chairs generally being soldtolibraries would cost over $97,000. That figure would not cover wooden, plastic, glass, or upholstered chairs. However, the research team will attempt to provide, on the basis of existing information and selective original testing, some basic performance standards for the basic library furniture and equipment. This matter can be discussed at greater length by the research team, the management panel and funding agency after detailed information is secured on what items have been and are presently tested.